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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/823,161

04/13/2004

Michael Frank

PIX-P-064

4544

32566 7590 01/30/2008

PATENT LAW GROUP LLP  
2635 NORTH FIRST STREET  
SUITE 223  
SAN JOSE, CA 95134

EXAMINER

CHEN, CHIA WEI A

ART UNIT

PAPER NUMBER

2622

MAIL DATE

DELIVERY MODE

01/30/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/823,161

**Applicant(s)**

FRANK, MICHAEL

**Examiner**

Chia-Wei A. Chen

**Art Unit**

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, see page 4-paragraph 2 to page 6-paragraph 2 filed 11/13/2007, with respect to the rejection(s) of claim(s) 1 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ueno et al. (US 5,334,829).

### ***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1, 6, 8, 9, 14, 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueno et al. (US 5,334,829).

As to Claim 1, Ueno et al. teaches, in figure 1, an integrated circuit package for an image sensor chip, the image sensor chip including a sensor area for sensing incident light and a circuitry area (col. 3, lines 64-67), the package comprising:

- a substrate (package 2) including a first surface for receiving an image sensor chip and a second surface having an array of contact terminals formed thereon (col. 4, lines 8-15, 36-42); and
- a heater element (5) having a first terminal and a second terminal coupled to a first contact terminal and a second contact terminal, respectively, of the array of contact

terminals, the heater element being positioned on the first surface of the substrate and underneath the sensor area of the image sensor chip to be assembled in the package (col. 4, lines 16-26, 36-42),

- wherein the heater element provides heating of the sensor area of the image sensor chip when a first voltage is applied across the first contact terminal and the second contact terminal (col. 4, lines 50-61); and
- wherein the image sensor chip is attached to the first surface of the substrate so that the heater element is sandwiched between the sensor area of the image sensor chips and the first surface of the substrate (package 2) (Figs. 1, 4).

Reading the claims in the broadest sense, the heating element is sandwiched between the image sensor (1) and the package substrate (2).

As to claim 6, Ueno et al. teaches the integrated circuit package of claim 1, wherein the package comprises a pin grid array package and the array of contact terminals comprises an array of contact pins (pins 9a, 9b, 9c, Fig. 1,).

As to claim 8, Ueno et al. teaches the integrated circuit package of claim 1, wherein the heater element comprises a resistive heater element (7, col. 4, line 30).

As to claim 9, Ueno et al. teaches the integrated circuit package of claim 8, wherein the resistive heater element comprises a material selected from conductive plastic and conductive metals (col. 6, lines 8-16).

As to claim 14, Ueno et al. teaches the integrated circuit package of claim 8, wherein the first terminal of the heater element is connected to the first contact terminal through a first via interconnect (9a) through the substrate of the package and the second terminal of the heater element is connected to the second contact terminal through a second via interconnect (9b) through the substrate of the package (Fig. 3).

As to claim 15, Ueno et al. teaches the integrated circuit package of claim 1, further comprising a heat spreader formed in the substrate (The heating device is formed on a lower surface of the insulating material to uniformly heat the solid state imaging device, thus acting as a heat spreader; col. 5, lines 60-68.).

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. in view of Anton (US 2003/0089957 A1).

As to claim 3, Ueno et al. teaches the integrated circuit package of claim 2, but does not teach wherein the image sensor chip is attached to the heater element and the first surface of the substrate using an epoxy glue.

Anton teaches wherein the image sensor chip is attached to the heater element and the first surface of the substrate using an epoxy glue (gelatinous material RBC Epoxy, paragraph [0017]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the epoxy glue of Anton with the integrated circuit package of Ueno et al. in order to maintain the temperature of the chip in a stable manner. (See paragraph [0003] of Anton.)

6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. (US 5,334,829).

Ueno et al. discloses substantially the claimed invention as set forth in the discussion for claims 4 and 5.

Ueno et al. does not disclose expressly wherein the array of contact terminals comprises an array of contact balls or contact pads.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to configure the array of contact terminals to be contact balls or pads. Applicant has not disclosed that configuring the array of contact terminals to be contact balls or pads provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, further more, would have expected Applicant's invention to perform equally well with either the contact pins taught by Ueno et al. or the claimed contact balls or pins because both contact terminal designs perform the same

function of allowing an electrical path to the components of the integrated circuit package. Therefore, it would have been obvious to modify Ueno et al. to obtain the invention as specified in claims 4 and 5.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. in view of Ozimek et al. (US 5,865,935).

As to claim 7, Ueno et al. teaches the integrated circuit package of claim 1, but does not teach wherein the package comprises a ceramic or plastic leaded chip carrier and the array of contact terminals comprises an array of contact pins formed on the side surfaces of the package.

Ozimek et al. teaches wherein the package comprises a ceramic (12) or plastic leaded chip carrier and the array of contact terminals comprises an array of contact pins (22) formed on the side surfaces of the package (Fig. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the ceramic chip carrier of Ozimek et al. with the integrated circuit package of Ueno et al. to provide an improved method for securing image sensors to a ceramic member and to provide the smallest possible diameter available to adequately house the image sensor and to provide greater integrity of the package. (See col. 2, lines 18-25 of Ozimek et al.)

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. in view of Ito et al. (US 2003/0164365 A1).

As to claim 10, Ueno et al. teaches the integrated circuit package of claim 8, wherein the resistive heater element is formed in a narrow serpentine shape. Ueno et al. does not teach wherein the resistive heater element is formed of tungsten.

Ito et al. teaches wherein the resistive heater element is formed of tungsten (paragraph [0105] of Ito et al.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the tungsten heating element of Ito et al. with the integrated circuit package of Ueno et al. so that thermal diffusion of the impurities from the ceramic heater to the semiconductor wafer can be prevented. (See paragraph [0014] of Ito et al.)

9. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. in view of Barlow et al. (US 4,420,261).

As to claim 11, Ueno et al. teaches the integrated circuit package of claim 1, but does not teach a protection resistor coupled between the first terminal and the second terminal of the heater element.

Barlow et al. teaches a protection resistor coupled between the first terminal and the second terminal of the heater element (resistors 102 and 103, col. 11, lines 37-40).



Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the protection resistor of Barlow et al. with the integrated circuit package of Ueno et al. to protect the output against static electric discharges or other accidental stress. (See col. 11, lines 38-40).

As to claim 12, Ueno et al. in view of Barlow et al. teaches the integrated circuit package of claim 11, wherein the protection resistor comprises a high resistance resistor (col. 11, lines 37-40).

As to claim 13, Ueno et al. in view of Barlow et al. teaches the integrated circuit package of claim 12, wherein the resistance of the protection resistor is about 100 Ohms or greater (col. 11, lines 37).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chia-Wei A. Chen whose telephone number is 571-270-1707. The examiner can normally be reached on Monday - Friday, 7:30 - 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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1/22/08



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SUPERVISORY PATENT EXAMINER